REMARKS

I. STATUS OF THE CLAIMS

Claims 10-22, 30-35, and 38-66 are pending in the present application, prior to this Amendment. In the Office Action mailed January 14, 2005, claims 10-22, 30-35 and 38-66 were rejected. Claims 10-22, 30-35, and 38-66 are canceled hereby without prejudice and without concession. New claims 67-102 are added. Support for new claims 67-102 can be found throughout the specification. Thus, no new matter is presented.

II. CLAIM REJECTIONS UNDER 35 U.S.C. §112

Claims 10-22 and 32-33 are rejected as under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention. Claims 10-22 and 32-33 are canceled hereby. Thus, it is believed that this rejection is obviated and should be withdrawn.

III. CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 10, 21, 30, 32, and 35 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Usui* in view of *Easwaran*. Claims 11-17, 20, 22, and 31 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Usui* in view of *Easwaran* and further in view of *Conroy* et al. Claims 18, 19, 33, and 34 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Usui* in view of *Easwaran* and further in view of *Crafton* (U.S. Pat. Nos. 5,294,094 and 5,565,046). Claims 38-66 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Easwaran* in view of *Ryan* et al. Applicant traverses these rejections and the stated grounds therefore. Nonetheless, claims 10-66 are canceled without prejudice by this amendment. As such, it is believed that these rejections are obviated and should be withdrawn.

IV. NEW CLAIMS

New claims 67-102 are added by this Amendment. New claims 67-102 are believed to be allowable over the prior art in that none of the cited references, alone or in combination, teach or suggest the methods and systems described therein.

For example, claims 67-102 are believed to be allowable over *Usui* and *Easwaran*, alone or in combination. The Office Action states that *Usui* teaches "heat treatment of the casting of the mold." Applicant respectfully disagrees. *Usui* makes no reference to heat treatment of a casting within the mold. Instead, *Usui* merely describes an apparatus for heat treating a casting and removing a core therefrom (col. 1, lines 46-53).

The combination of *Easwaran* and *Usui* is not sufficient to render Applicant's claimed invention obvious. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference or combination of references must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on the Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); MPEP §2142. It is submitted respectfully that the cited references are not sufficient to support a *prima facie* case of obviousness.

There is no motivation to combine the teachings of *Easwaran* with the teachings of *Usui*. *Easwaran* is directed to a method of forming an "investment-type" mold and heat treating a casting therein. *Easwaran* teaches pouring a molten metal into a ceramic shell that is supported in a particulate medium. The solidifying metal is maintained at the appropriate heat treatment temperature until the metal is heat treated (col. 5, lines 60-65). As recognized by the Court of Appeals for the Federal Circuit, the claimed invention must be viewed not only for its structure and properties, but also for the problem that it solves. *In re Wright*, 848 F.2d 1216, 6 USPQ2d 1959 (Fed. Cir. 1988). *Usui* is directed to a method of removing the core from a casting. *Easwaran* is directed to forming a particular type of mold and heat treating a casting therein. Given that *Easwaran* and *Usui* seek to solve different problems, there is no motivation to combine their teachings. Likewise, given the apparent differences in the technical fields of *Easwaran* and *Usui*, there is no reasonable expectation that *Easwaran* and *Usui* would result in a successful combination.

Further, even if the references are combined properly, neither *Easwaran* or *Usui*, nor the combination thereof, teach or suggest all elements of Applicant's claimed invention. For example, with respect to new claim 67, neither *Easwaran* nor *Usui* teach or suggest pre-heating the mold to a temperature of at least about the heat treatment temperature for the metal of the casting. Thus, it is believed that a *prima facie* of obviousness cannot be made.

As another example, claims 67-102 are believed to be allowable over *Easwaran* in view of *Ryan*. According to the Office Action, *Easwaran* teaches the formation of "a cooling arrest casting (frozen casting) in the mold" (Office Action, page 4). It is not clear what is meant by "a cooling arrest casting." The cited portion of *Easwaran* teaches pouring a molten metal into a ceramic shell supported in a particulate medium. The solidifying metal is maintained at the appropriate heat treatment temperature, while being supported in a particulate medium, until the metal is heat treated (col. 5, lines 60-65).

In sharp contrast, *Ryan* is directed to a particular stainless steel alloy (referred to as "X-11") that exhibits improved machinability and drillability when using an accelerated in-mold heat treatment (Abstract; col. 2, line 67 through col. 3, lines 1-4; col. 3, lines 53-54). The method of *Ryan* teaches controlling the rate of cooling of inside and outside temperature of the X-11 casting "so that both temperatures slowly decrease at the same rate" (col. 3, lines 26-28). One of ordinary skill in the art would not seek to supplement the teachings of *Easwaran*, directed to a method of forming an investment-type mold and heat treating a casting therein, with a reference about improving the machinability and drillability of the X-11 metal alloy. Thus, there is no motivation to combine the reference teachings and no reasonable expectation that the two references would result in a successful combination.

Furthermore, it is submitted respectfully that neither *Easwaran* nor *Ryan*, alone or in combination, teach or suggest all elements of Applicant's claimed invention. By way of example only, with respect to claim 80, neither *Easwaran* nor *Ryan* teach or suggest maintaining the temperature of the metal at or above a process control temperature for the metal during processing. Thus, it is submitted that the combination of *Easwaran* and *Ryan* is insufficient to support a *prima facie* case of obviousness.

CONCLUSION

The foregoing is submitted as a full and complete response to the Office Action mailed January 14, 2005, and is believed to place all claims in the application in condition for allowance. Such action is courteously solicited.

If the Examiner believes that there are any issues that can be resolved by telephone conference, or if there are any informalities that may be addressed by an Examiner's amendment, the Examiner is invited to contact the undersigned at (404) 879-2437.

The Commissioner is hereby authorized to charge any fees due, or credit any overpayment, to Deposit Account No. 09-0528.

Respectfully submitted,

Dana E. Stano

Date: June 14, 2005

Dana E. Stano
Registration No. 50,750
Louis T. Isaf
Registration No. 29,078

Womble Carlyle Sandridge & Rice, PLLC
P.O. Box 7037
Atlanta, GA 30357-0037
(404) 879-2437 (Telephone)
(404) 879-2937 (Facsimile)
Docket No.: C152 1092.1 (38041.0023.6)